

CLAIMS:

1. An X-ray examination apparatus which includes

- an X-ray source (1) for emitting an X-ray beam (8) having a central X-ray extending along a central beam line (4), and
 - an X-ray detector (2) for picking up X-ray images, where
- 5 - the X-ray detector (2) and the X-ray source (1) are rotatable together about an axis of rotation (3), and
- a calibration system (6, 7) which is provided with
 - a calibration phantom (6) and
 - a calibration control unit (7) which is arranged
- 10 - to form separate calibration images for different, notably essentially opposed directions of the X-ray beam, and
- to determine the zero orientation of the X-ray source with the X-ray detector from differences between the positions in the individual calibration images of the same aspect of the imaged calibration phantom, where
- 15 - the central beam line (4) extends perpendicularly to the axis of rotation (3) in the zero orientation.

2. An X-ray examination apparatus as claimed in claim 1, wherein the axis of rotation and the central beam line intersect in an isocenter (9), and

- 20 - wherein the calibration phantom is positioned outside the isocenter so as to form the calibration X-ray images.

3. An X-ray examination apparatus as claimed in claim 2, wherein the distance between the isocenter and the calibration phantom during the formation of at least one of the

25 calibration X-ray images is larger than the distance between the X-ray detector and the calibration phantom.

4. An X-ray examination apparatus as claimed in claim 1, wherein

- the X-ray detector is arranged to derive electronic calibration image signals from the calibration X-ray images,
- the calibration control unit is arranged to suppress electronic parts of the electronic calibration image signals, the suppressed parts being situated symmetrically relative to the center of the calibration images, and
- to display masked calibration images on the basis of the partly suppressed electronic image signals and to calibrate the zero orientation on the basis of the masked calibration images.

10 5. An X-ray examination apparatus as claimed in claim 1, wherein the calibration system includes a tower with a plurality of mating structural elements for supporting the calibration phantom.